Office Action Summary	Application No.	Applicant(s)	
	10/812,260	WAKUMOTO ET AL.	
	Examiner	Art Unit	
	WARNER WONG	2471	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 December 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1-3, 8-9, and 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bryant (US 2005/0078656) in view of Luo (US 6,377,551) and Cain (US 6,928,483).

Regarding claim 1, Bryant describes a method for cost determination for paths between switches in a mesh (fig. 1), comprising:

defining a set of paths between each pair of the mesh switches, each pair comprising a source switch and a destination switch (fig. 1 & para. 6-8, determining from a set of possible routes an optimal route (paths) between pair comprising R1 101 (source switch) and R5 105 (destination switch));

calculating start-up costs for the previously-defined paths (para. 38, calculating the optimal route with the lowest-cost from all possible known (previously defined) routes (start-up costs for the paths));

recalculating costs for the previously defined paths using a cost protocol (para. 78, re-computing (re-calculating) & comparing LSPs (paths) for the optimal route (path) due to change in cost of a link) by transmitting a directed cost packet down each of the previously defined paths from the destination switch to the source switch for each pair

(fig. 1 in view of para. 8 & 28, R5 105 (destination switch) advertises change information throughout the network (to all links/previously defined paths), where advertisements are propagated (para. 34) to R1 (source switch), and comprise associated cost, para. 5).

Bryant describes recalculation of costs, but fails to explicitly describe: the recalculation uses a directed cost protocol.

Luo describes a route computation method comprising: recalculation using a directed cost protocol (fig. 3 step 44, route determination method (protocol) re-evaluates (recalculates) metric such as cost (abstract) based on a directed graph (directed cost), fig. 17 & col. 8, lines 64-67).

It would have been obvious to one with ordinary skill in the art at the time of invention by applicant to specify that the recalculation of Bryant is performed using a directed cost protocol as in Luo.

The motivation for combining the teachings is that it provides an improved route computation algorithm for communication network (Luo, col. 2, lines 40-42).

Bryant and Luo combined describing transmitting a direct cost packet, but failed to explicitly describe:

transmitting to only the previously defined paths.

Cain describes previously defined paths (fast paths), and transmission of link states (cost) whenever link status changes (col. 2, lines 7-9, transmission of Link Status Advertisement (LSA) as part of link status (cost) updates), further describing:

transmitting to only the previous defined paths (col. 6, lines 32-39, unicasting LSA message only to a particular outbound interface according to the fast path,= routing forwarding logic, see col. 1, lines 45-46).

It would have been obvious to one with ordinary skill in the art at the time of invention by applicant for the method of Bryant and Luo combined to incorporate cost transmission to only the previously defined paths as in Cain.

The motivation for combining the teachings is that it prevents a significant delay in propagating the LSA protocol messages to all routers (Cain, col. 1, lines 20-24).

Regarding claim 2, Bryant further describes:

the directed cost protocol comprises generating at the destination switch a cost packet with path information associated with a specific path (fig. 1 & para. 5, network node R5 (destination switch) advertises (generates) information comprising a cost metric associated to each individual link (a specific path)).

Regarding claim 3, Bryant further describes:

unicasting the cost packet via the specific path to a second switch (para. 6, the generation & propagation (= forwarding) of the link state advertisement packet from one switch/router to another along any one route (specific path) is equivalent to unicasting).

Regarding claim 8, Bryant further describes:

start-up cost packets are flooded through the mesh in order to define the set of paths between each pair of mesh switches and calculate the start-up costs (para. 6, flooding of costs using LSP packets in order to calculate and determine the lowest cost paths between each network node pair).

Regarding claim 9, Bryant describes a mesh network for cost determination for paths between switches in a mesh (fig. 1), comprising:

means for defining a set of paths between each pair of the mesh switches, each pair comprising a first switch and a second switch (fig. 1 & para. 6-8, determining from a set of possible routes an optimal route (paths) between pair comprising R1 101 (source switch) and R5 105 (destination switch));

means for calculating start-up costs for the paths (para. 38, calculating the optimal route with the lowest-cost from all possible routes (start-up costs for the paths));

means for recalculating costs for the previously defined paths using a cost protocol (para. 78, re-computing (re-calculating) & comparing LSPs (paths) for the optimal route (path) due to change in cost of a link) by transmitting a directed cost packet down each of the previously defined paths from the destination switch to the source switch for each pair (fig. 1 in view of para. 8 & 28, R5 105 (second switch) advertises change information throughout the network (to all links/previously defined paths), where advertisements are propagated (para. 34) to R1 (first switch), and comprise associated cost, para. 5).

Bryant describes recalculation of costs, but fails to explicitly describe: the recalculation uses a directed cost protocol.

Luo describes a route computation method comprising: recalculation using a directed cost protocol (fig. 3 step 44, route determination method (protocol) re-evaluates (recalculates) metric such as cost (abstract) based on a directed graph (directed cost), fig. 17 & col. 8, lines 64-67).

It would have been obvious to one with ordinary skill in the art at the time of invention by applicant to specify that the recalculation of Bryant is performed using a directed cost protocol as in Luo.

The motivation for combining the teachings is that it provides an improved route computation algorithm for communication network (Luo, col. 2, lines 40-42).

Bryant and Luo combined describing transmitting a direct cost packet, but failed to explicitly describe:

transmitting to only the previously defined paths.

Cain describes previously defined paths (fast paths), and transmission of link states (cost) whenever link status changes (col. 2, lines 7-9, transmission of Link Status Advertisement (LSA) as part of link status (cost) updates), further describing:

transmitting to only the previous defined paths (col. 6, lines 32-39, unicasting LSA message only to a particular outbound interface according to the fast path,= routing forwarding logic, see col. 1, lines 45-46).

It would have been obvious to one with ordinary skill in the art at the time of invention by applicant for the method of Bryant and Luo combined to incorporate cost transmission to only the previously defined paths as in Cain.

The motivation for combining the teachings is that it prevents a significant delay in propagating the LSA protocol messages to all routers (Cain, col. 1, lines 20-24).

Regarding claim 15, Bryant describes a packet switch in a switch mesh (fig. 1, router R1 101 in a mesh network), comprising:

a plurality of ports configured to connect to a destination switch in the switching mesh (fig. 1, R1 101 has ports to other routers to R5 105 (destination switch));

a switch control device coupled to the plurality of ports (para. 88-89 & fig. 12, processor 144 (switch control device) connected to ports in a router) configured to define a set of paths from the packet switch to the destination switch (fig. 1 & para. 6-8, determining from a set of possible routes an optimal route (paths) between pair comprising R1 101 (source switch) and R5 105 (destination switch)), calculate start-up cost for the previous defined paths (para. 38, calculating the optimal route with the lowest-cost from all possible routes (start-up costs for the paths mentioned)), and execute directed cost protocol instructions in order to recalculate costs for previously defined paths (abstract & para. 35, updating (recalculating) routing information comprising cost metric after a delay) by receiving a directed cost packet down each of the previously defined paths from the destination switch to the source switch for each pair (fig. 1 in view of para. 8 & 28, R5 105 (destination switch) advertises change information throughout the network (to all links/previously defined paths), where advertisements are propagated to (para. 34) (received by) to R1, and comprise associated cost, para. 5).

Bryant describes recalculation of costs, but fails to explicitly describe: the recalculation uses a directed cost protocol.

Luo describes a route computation method comprising: recalculation using a directed cost protocol (fig. 3 step 44, route determination method (protocol) re-evaluates

(recalculates) metric such as cost (abstract) based on a directed graph (directed cost), fig. 17 & col. 8, lines 64-67).

It would have been obvious to one with ordinary skill in the art at the time of invention by applicant to specify that the recalculation instructions of Bryant are performed using a directed cost protocol as in Luo.

The motivation for combining the teachings is that it provides an improved route computation algorithm for communication network (Luo, col. 2, lines 40-42).

Bryant and Luo combined describing transmitting a direct cost packet, but failed to explicitly describe:

transmitting to only the previously defined paths.

Cain describes previously defined paths (fast paths), and transmission of link states (cost) whenever link status changes (col. 2, lines 7-9, transmission of Link Status Advertisement (LSA) as part of link status (cost) updates), further describing:

transmitting to only the previous defined paths (col. 6, lines 32-39, unicasting LSA message only to a particular outbound interface according to the fast path,= routing forwarding logic, see col. 1, lines 45-46).

It would have been obvious to one with ordinary skill in the art at the time of invention by applicant for the method of Bryant and Luo combined to incorporate cost transmission to only the previously defined paths as in Cain.

The motivation for combining the teachings is that it prevents a significant delay in propagating the LSA protocol messages to all routers (Cain, col. 1, lines 20-24).

Regarding claim 16, Bryant further describes:

generate a cost packet with path information associated with a specific path between the packet switch and the destination switch (fig. 1 & para. 5, network node R5 (destination switch) advertises (generates) to R1 (packet switch) information comprising a cost metric associated to each individual link (a specific path)).

Regarding claim 17, Bryant further describes:

unicasting the cost packet via the specific path to the packet switch (para. 6, the generation & propagation (= forwarding) of the link state advertisement packet from one switch/router to another along any one route (specific path) is equivalent to unicasting).

Regarding claim 18, Bryant further describes:

repeating the recalculation at periodic intervals (abstract & para. 35, updating (recalculating) routing information comprising cost metric after a delay).

2. Claim 4-6 and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bryant in view of Luo and Cain as applied to claims 3 and 17 above respectively, and further in view of Kelsey (US 2005/0249215).

Regarding claim 4, Bryant fails to describe that the intermediate switches along the specific path each add cost information to the cost packet prior to forwarding the cost packet to a next switch along the specific path.

Kelsey describes that intermediate switches along the specific path each add cost information to the cost packet prior to forwarding the cost packet to a next switch along the specific path (fig. 2 & para. 52, intermediate nodes B & C increment the accrued cost field 228 within the unicast message 220A).

It would have been obvious to one with ordinary skill in the art at the time of invention by applicant to specify that the intermediate switches along the specific path add cost information of the cost packet as in Kelsey for the cost packets in Bryant, Luo and Cain combined.

The motivation for combining the teachings is that such protocol with cost packet comprising an accrue cost field results is a more efficient routing (Kelsey, para. 31).

Regarding claim 5, Bryant further describes:

repeating the recalculation at periodic intervals (abstract & para. 35, updating (recalculating) routing information comprising cost metric after a delay).

Regarding claim 6, Bryant describes the use of cost packets, but fails to describe that the cost packet piggybacking information for more than one path.

Kelsey describes:

piggybacking information for more than one path into a packet (fig. 2 &para. 101, use of source routing comprises appending (piggybacking) each intermediate routing information to the cost-related packet 220B from source to destination).

Regarding claim 19, Bryant describes the use of cost packets, but fails to describe that the cost packet piggybacking information for more than one path.

Kelsey describes:

piggybacking information for more than one path into a packet (fig. 2 &para. 101, use of source routing comprises appending (piggybacking) each intermediate routing information to the cost-related packet 220B from source to destination).

Regarding claim 20, Bryant further suggests:

perform a flood discovery of paths at long periodic time intervals (para. 6, flooding of costs using LSP packets, propagating the updates in the order of 20 ms [longer] time intervals).

Regarding claim 21, Bryant further describes:

path costs determined by the flood discovery of paths are used to substitute more efficient paths for less efficient paths (para. 6, calculation of shortest path tree substitutes lowest cost paths (more efficient paths) for higher cost paths (less efficient paths)).

3. Claims 7 and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bryant, Luo and Cain as applied to claims 1 and 9 above respectively, and further in view of Erhart (US 20050068941).

Regarding claim 7, Bryant fails to describe: previously defined paths are identified by path tags inserted into packets sent between the mesh switches.

Erhart describes: previously defined paths are identified by path tags inserted into packets sent between the mesh switches (Erhart, para. 10, using Multiprotocol Label Switching network comprises labels (path tags) for each transmission packet).

It would have been obvious to one with ordinary skill in the art at the time of invention by applicant in using a communication scheme with a MPLS-based network as in Erhart for network communication in Bryant, Luo and Cain.

The motivation for combining the teachings is that it leads to an increase of quality of service in a packet-switched network (Erhart, para. 6).

Regarding claim 10, Bryant further describes:

start-up cost packets are flooded through the mesh in order to define the set of paths between each pair of mesh switches and calculate the start-up costs (para. 6, flooding of costs using LSP packets in order to calculate and determine the lowest cost paths between each network node pair), but fails to describe:

previously defined paths are identified by path tags inserted into packets sent between the mesh switches.

Erhart describes: previously defined paths are identified by path tags inserted into packets sent between the mesh switches (Erhart, para. 10, using Multiprotocol Label Switching network comprises labels (path tags) for each transmission packet).

Regarding claim 11, Bryant further describes:

repeating the recalculation at periodic intervals (abstract & para. 35, updating (recalculating) routing information comprising cost metric after a delay).

4. Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bryant in view of Luo, Cain and Erhart as applied to claim 11, and further in view of Kelsey.

Regarding claim 12, Bryant and Erhart combined describe the use of cost packet, but fail to describe:

generation at a second switch a cost packet with path information associated with a specific path that begins at a first switch and ends at the second switch and unicast transmission of the cost packet via the specific path to the first switch.

Kelsey describes:

generation at a second on switch a cost packet with path information associated with a specific path that begins at a first switch and ends at the second switch and unicast transmission of the cost packet via the specific path to the first switch (para. 101, source routing comprises generation of cost-related packet similar to fig. 2 220A at the second router/switch along with the entire source route comprising intermediate routing information to the first router/switch).

It would have been obvious to one with ordinary skill in the art at the time of invention by applicant to specify the use of source routing using the cost packet as in Kelsey for the cost packet transmission in the combined teachings of Bryant, Luo and Erhart.

The motivation for combining the teachings is that such protocol with cost packet comprising an accrue cost field results is a more efficient routing (Kelsey, para. 31).

Regarding claim 13, Bryant, Luo, Erhart and Kelsey combined further describe:

the intermediate switches along the specific path each add cost information to the cost packet prior to forwarding the cost packet to a next switch along the specific path (Kelsey, fig. 2 & para. 52, intermediate nodes B & C increment the accrued cost field 228 within the unicast message 220A).

Regarding claim 14, Bryant, Luo, Erhart and Kelsey combined further describe:

piggybacking information for more than one path into a packet (Kelsey, fig. 2 &para. 101, use of source routing comprises appending (piggybacking) each

intermediate routing information to the cost-related packet 220B from source to destination).

Response to Arguments

5. Applicant's arguments with respect to claims 1-21 have been considered but are moot in view of the new ground(s) of rejection.

The examiner has conducted an interview with the client indicating that should to the independent claims be clarifies the network an non-wireless mesh, the Kelsey reference requiring the destination and intermediate nodes to transmit and aggregate the costs associated with wireless transmission range will be invalidated (un-combinable), yielding possible allowable dependent claims 12-14.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Joshi (US 5,317,566) describing least cost route (re)-selection, Mann (US 6,310,883) describing a traffic route finder based on cost, Enomoto (US 2008/0159174) describing reconfiguration of network spanning tree routing after a cost change, and Kohler (US 7,633,873) describing optimization of routing path.

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WARNER WONG whose telephone number is (571)272-8197. The examiner can normally be reached on 6:30AM - 3:00PM, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi Pham can be reached on (571) 272-3179. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Chi H Pham/
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